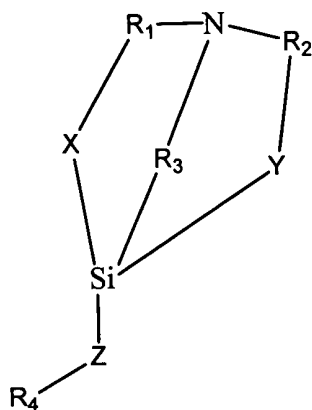


What is claimed is:

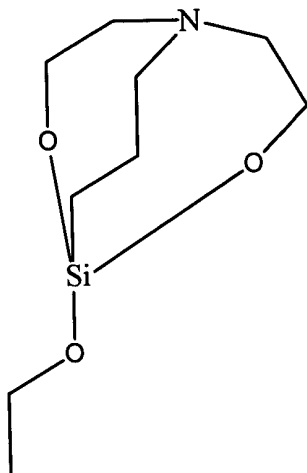
1. A cyclic silane having the formula



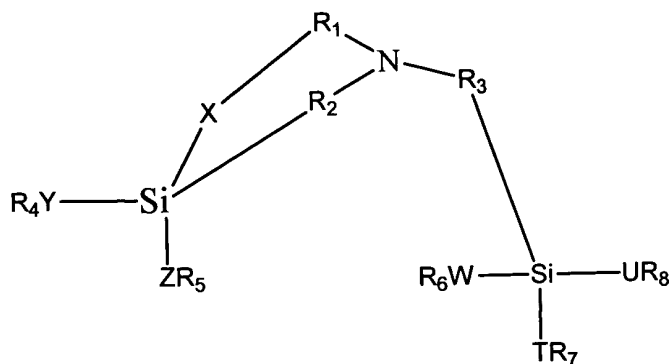
wherein R_1 , R_2 , R_3 and R_4 are independently alkyl, functionalized alkyl, aryl or alkoxy and X, Y and Z are independently a bond, O, S, NR_5 , wherein R_5 is H, alkyl, substituted alkyl, or aryl.

2. A cyclic silane according to claim 1 wherein X, Y and Z are O.
3. A cyclic silane according to claim 2 wherein R_1 , R_2 , R_3 and R_4 are independently C_1 to C_{10} alkyl.
4. A cyclic silane according to claim 3 wherein R_1 , R_2 and R_4 are ethyl.
5. A cyclic silane according to claim 3 wherein R_1 and R_2 are ethyl and R_4 is methyl.
6. A cyclic silane according to claim 4 wherein R_3 is propyl.
7. A cyclic silane according to claim 1 wherein R_1 and R_2 are alkoxy.
8. A cyclic silane according to claim 1 wherein R_1 and R_2 are $(CH_2CH_2O)_n$ wherein n is 1-4 and X and Y are bonds and Z is O.

9. A cyclic silane having the formula



10. A cyclic silane having the formula



wherein R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , R_7 and R_8 are independently alkyl, functionalized alkyl, aryl or alkoxy and T, R, U, X, Y, Z are independently a bond, O, S, NR_9 , wherein R_9 is H, alkyl, substituted alkyl, or aryl.

11. A cyclic silane according to claim 10 wherein T, R, U, X, Y, Z are O.

12. A cyclic silane according to claim 11 wherein R_4 , R_5 , R_6 , R_7 , and R_8 are ethyl.

13. A cyclic silane according to claim 11 wherein wherein $R_1, R_2, R_3, R_4, R_5, R_6, R_7$ and R_8 are, independently, C_1 to C_{10} alkyl.

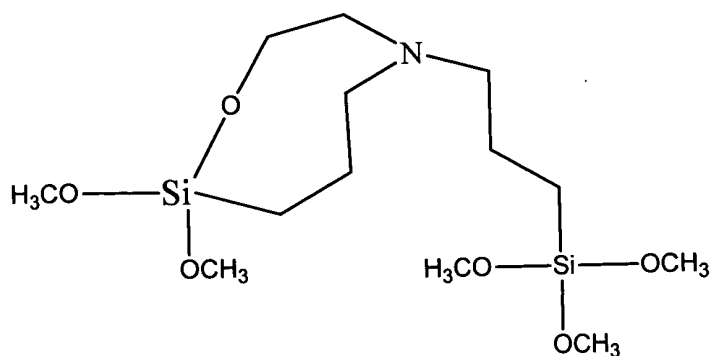
14. A cyclic silane according to claim 13 wherein R_4, R_5, R_6, R_7 and R_8 are methyl.

15. A cyclic silane according to claim 14 wherein R_1 is ethyl, R_2 is propyl and R_3 is propyl.

16. A cyclic silane according to claim 10 wherein R_1 is alkoxy.

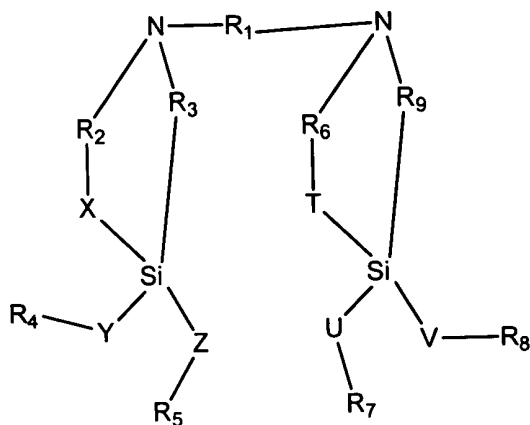
17. A cyclic silane according to claim 16 wherein R_1 is $(CH_2CH_2O)_n$ wherein n is 1-4 and X is a bond.

18. A cyclic silane having the formula



19. A composition of matter comprising a substantially pure cyclic silane according to any of claims 1-18, above.

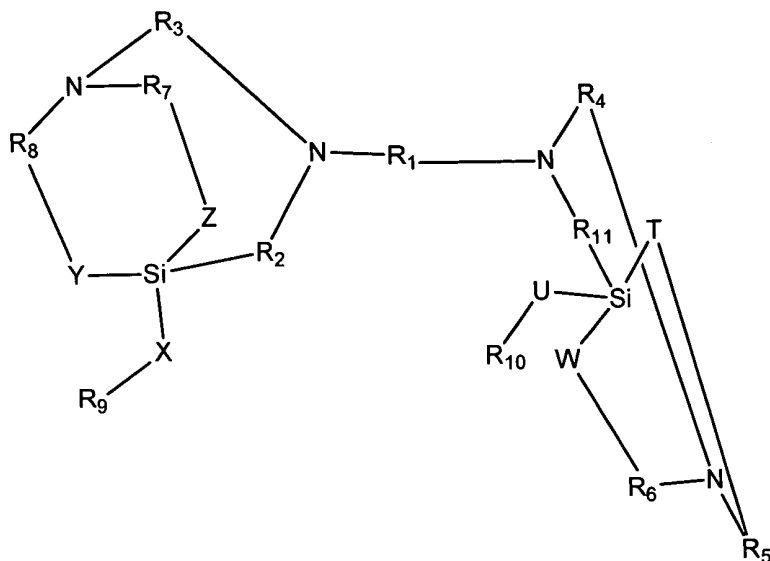
20. A cyclic silane having the formula



wherein R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , R_7 , R_8 , and R_9 are alkyl, substituted alkyl, aryl, or alkoxy; and T , U , V , X , Y , and Z are O , S , NHR_{10} , wherein R_{10} is H , alkyl, substituted alkyl, or aryl.

21. A cyclic silane according to claim 20 wherein R_1 , R_2 , and R_6 are ethyl, R_4 , R_5 , R_7 and R_8 are methyl and R_3 and R_9 are propyl ($-CH_2-$)₃; and T , U , V , X , Y , and Z are O .

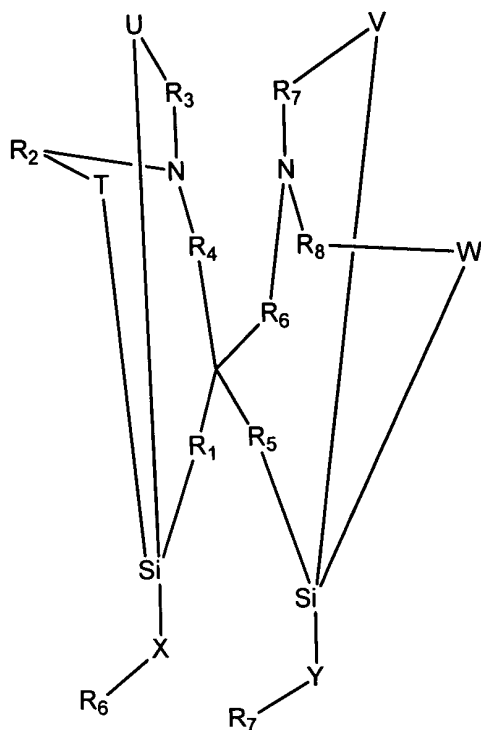
22. A cyclic silane having the formula:



wherein R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , R_7 , R_8 , R_9 , R_{10} and R_{11} are alkyl, substituted alkyl, aryl, or alkoxy and T , U , W , X , Y , and Z are O , S , NHR_{12} , wherein R_{12} is H , alkyl, substituted alkyl, or aryl.

23. A cyclic silane according to claim 22 wherein T, U, W, X, Y and Z are O; and R₁, R₃, R₄, R₅, R₆, R₇, R₈ are ethyl, R₂ and R₁₁ are propyl (-CH₂)₃, and R₉ and R₁₀ are methyl.

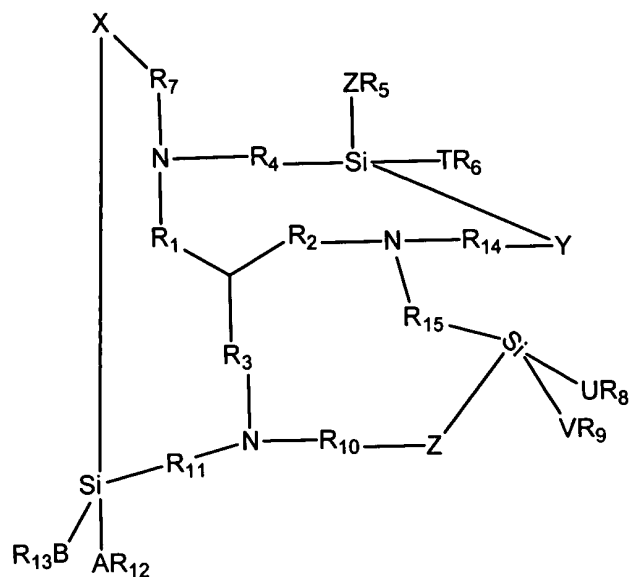
24. A cyclic silane having the formula:



wherein R₁, R₂, R₃, R₄, R₅, R₆, R₇, and R₈ are alkyl, substituted alkyl, aryl, or alkoxy and T, W, X, and Y are O, S, NHR₁₁, wherein R₁₁ is H, alkyl, substituted alkyl, or aryl.

25. A cyclic silane according to claim 24 wherein R₆ and R₇ are methyl, R₁ and R₅ are propyl (-CH₂)₃, R₂, R₃, R₄, and R₈ are ethyl and T, W, X, and Y are O.

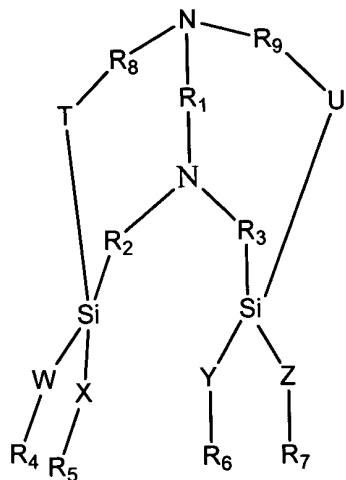
26. A cyclic silane having the formula:



wherein R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , R_7 , R_8 , R_9 , R_{10} , R_{11} , R_{12} , R_{13} , R_{14} , and R_{15} are alkyl, substituted alkyl, aryl, or alkoxy and A, B, T, U, V, X, Y and Z are O, S, NHR_{16} , wherein R_{16} is H, alkyl, substituted alkyl, or aryl.

27. A cyclic silane according to claim 26 wherein R_4 , R_{11} , and R_{15} are propyl ($-CH_2-$)₃, R_1 , R_2 , R_3 , R_5 , R_6 , R_7 , R_8 , R_9 , R_{10} , R_{12} , R_{13} , R_{14} are ethyl, and A, B, T, U, V, X, Y and Z are O.

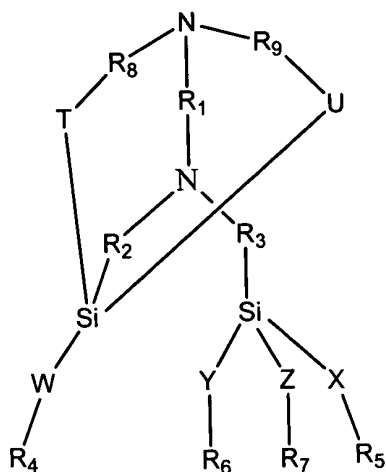
28. A cyclic silane having the formula



wherein R₁, R₂, R₃, R₅, R₆, R₇, R₈, and R₉, are alkyl, substituted alkyl, aryl, or alkoxy and T, U, W, X, Y and Z are O, S, NHR₁₀, wherein R₁₀ is H, alkyl, substituted alkyl, or aryl.

29. A cyclic silane according to claim 28 wherein R₁, R₂ and R₃ are propyl (-CH₂-)₃, R₄, R₅, R₆, R₇, R₈, and R₉ are ethyl and T, U, W, X, Y, and Z are O.

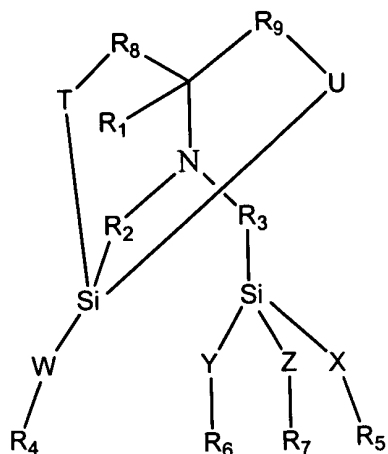
30. A cyclic silane having the formula



wherein R₁, R₂, R₃, R₄, R₅, R₆, R₇, R₈, and R₉, are alkyl, substituted alkyl, aryl, or alkoxy and T, U, W, X, Y and Z are O, S, NHR₁₀, wherein R₁₀ is H, alkyl, substituted alkyl, or aryl.

31. A cyclic silane according to claim 30 wherein R₁, R₂ and R₃ are propyl (-CH₂-)₃, R₄, R₅, R₆, R₇, R₈, and R₉ are ethyl and T, U, W, X, Y, and Z are O.

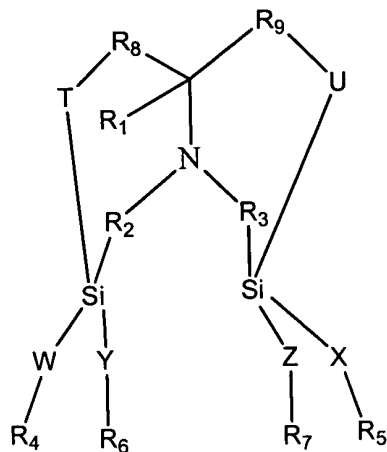
32. A cyclic silane having the formula



wherein R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , R_7 , R_8 , and R_9 , are alkyl, substituted alkyl, aryl, or alkoxy and T , U , W , X , Y and Z are O , S , NHR_{10} , wherein R_{10} is H , alkyl, substituted alkyl, or aryl.

33. A cyclic silane according to claim 32 wherein R_2 and R_3 are propyl $(-CH_2-)_3$, R_1 , R_8 and R_9 is methyl, R_4 , R_5 , R_6 , R_7 are ethyl and T , U , W , X , Y , and Z are O .

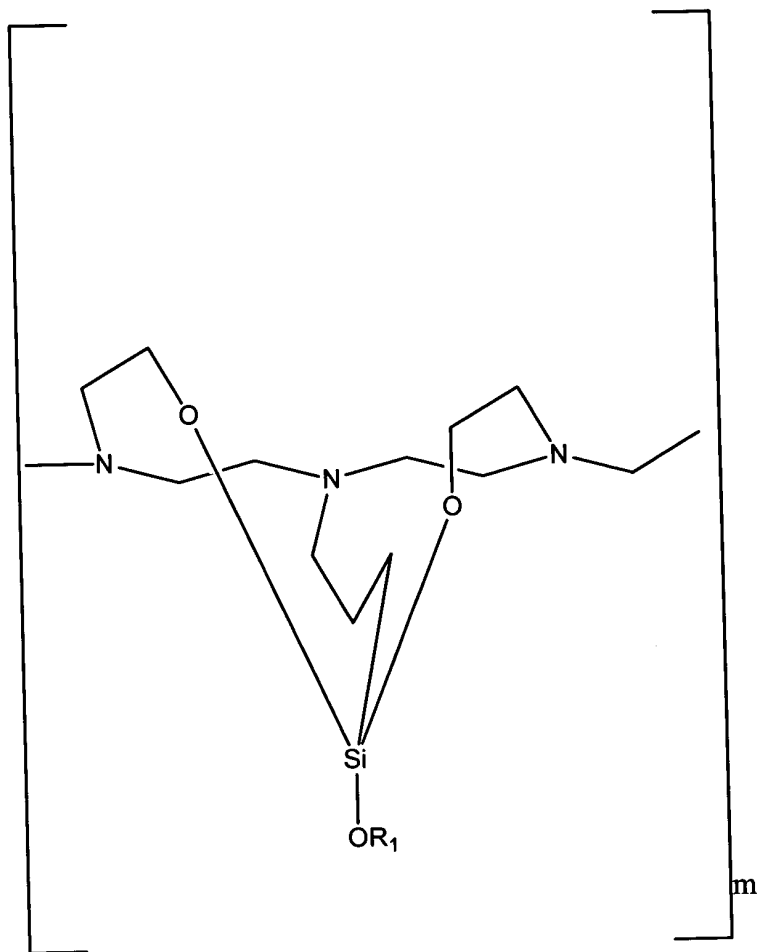
34. A cyclic silane having the formula



wherein R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , R_7 , R_8 , and R_9 , are alkyl, substituted alkyl, aryl, or alkoxy and T , U , W , X , Y and Z are O , S , NHR_{10} , wherein R_{10} is H , alkyl, substituted alkyl, or aryl.

35. A cyclic silane according to claim 34 wherein R_2 and R_3 are propyl $(-CH_2-)_3$, R_1 , R_8 and R_9 are methyl, R_4 , R_5 , R_6 , R_7 are ethyl and T , U , W , X , Y , and Z are O .

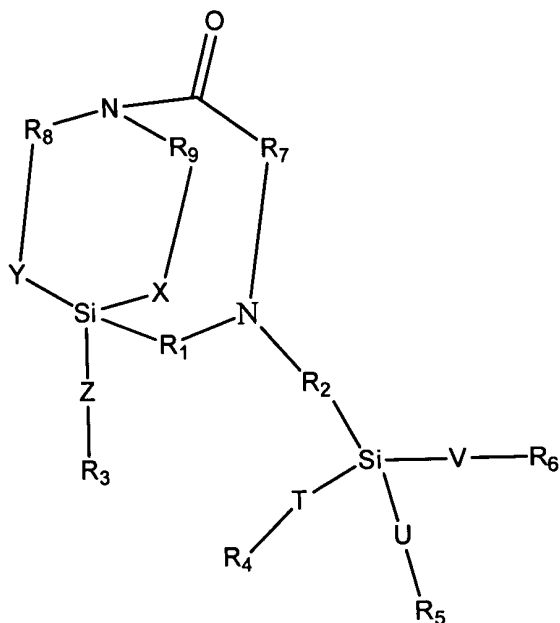
36. A cyclic silane having the formula:



wherein R_1 is alkyl, substituted alkyl, aryl, or alkoxy and repeating and m is an interger from 5 to 10,000.

37. A cyclic silane according to claim 36 wherein R_1 is methyl or ethyl.

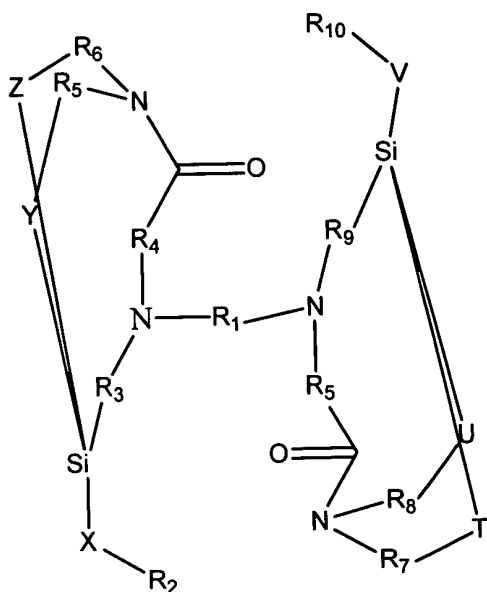
38. A cyclic silane having the formula



wherein R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , R_7 , R_8 , and R_9 , are alkyl, substituted alkyl, aryl, or alkoxy and T , U , V , X , Y and Z are O , S , NHR_{10} , wherein R_{10} is H , alkyl, substituted alkyl, or aryl.

39. A cyclic silane according to claim 38 wherein R_3 , R_4 , R_5 and R_6 are methyl, R_1 and R_2 are propyl ($-\text{CH}_2)_3$, R_7 , R_8 , and R_9 are ethyl and T , U , V , X , Y and Z are O .

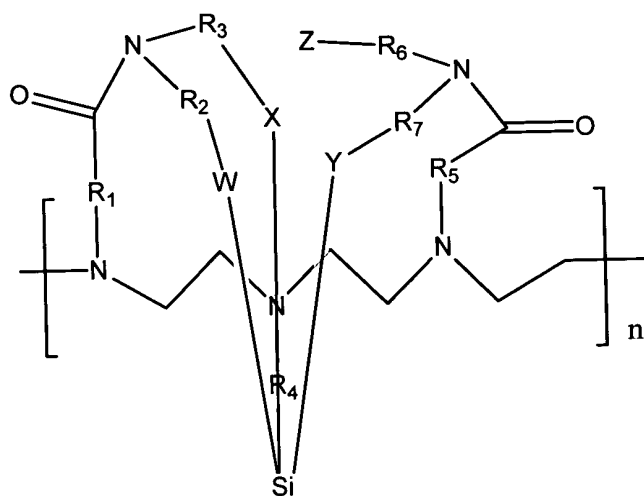
40. A cyclic silane having the formula



wherein R₁, R₂, R₃, R₄, R₅, R₆, R₇, R₈, R₉, and R₁₀ are alkyl, substituted alkyl, aryl, or alkoxy and T, U, V, X, Y and Z are O, S, NHR₁₁, wherein R₁₁ is H, alkyl, substituted alkyl, or aryl.

41. A cyclic silane according to claim 40 wherein R₁, R₄, R₅, R₆, R₇ and R₈ are ethyl, R₃ and R₉ are propyl, R₂ and R₁₀ are methyl, and T, U, V, X, Y, and Z are O.

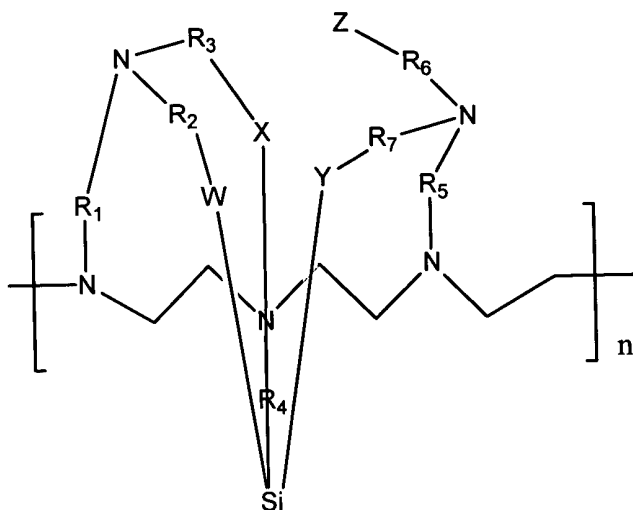
42. A cyclic silane having the formula



wherein R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , and R_7 are alkyl, substituted alkyl, aryl, or alkoxy and W, X, Y and Z are O, OH, S, NHR_8 , wherein R_8 is H, alkyl, substituted alkyl, or aryl and n is an integer from 5 to 10,000.

43. A cyclic silane according to claim 42 wherein R_4 is propyl, R_1 , R_2 , R_3 , R_5 , R_6 , and R_7 are ethyl and W, X, Y and Z are O or OH.

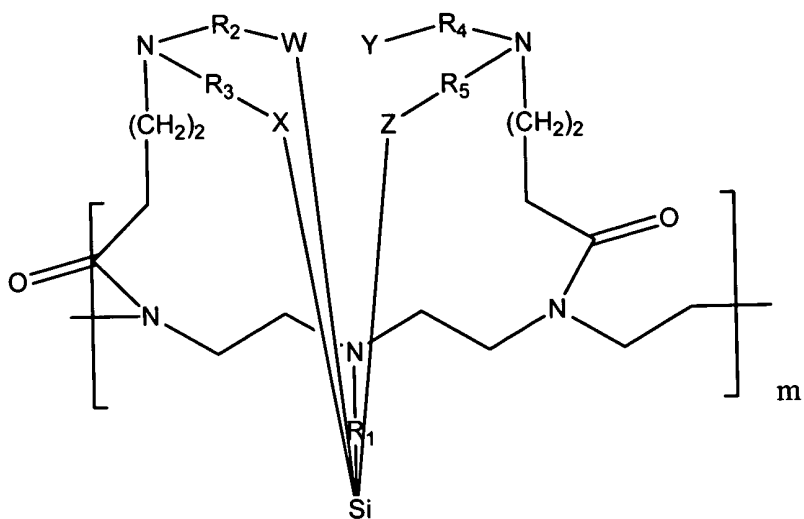
44. A cyclic silane having the formula



wherein R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , and R_7 are alkyl, substituted alkyl, aryl, or alkoxy and W, X, Y and Z are O, OH, S, NHR_8 , wherein R_8 is H, alkyl, substituted alkyl, or aryl and n is an integer from 5 to 10,000.

45. A cyclic silane according to claim 44 wherein R_4 is propyl, R_1 , R_2 , R_3 , R_5 , R_6 , and R_7 are ethyl and W, X, Y and Z are O or OH.

46. A cyclic silane having the formula



wherein R_1 , R_2 , R_3 , R_4 and R_5 are alkyl, substituted alkyl, aryl, or alkoxy and W , X , Y and Z are O , OH , S , NHR_6 , wherein R_6 is H , alkyl, substituted alkyl, or aryl and m is an integer from 5 to 10,000.

47. A cyclic silane according to claim 46 wherein R_1 is propyl $(-CH_2-)_3$, R_1 , R_2 , R_3 , and R_5 are ethyl and W , X , Y and Z are O or OH .

48. A composition of matter comprising a substantially pure cyclic silane according to any of claims 20-47, above.